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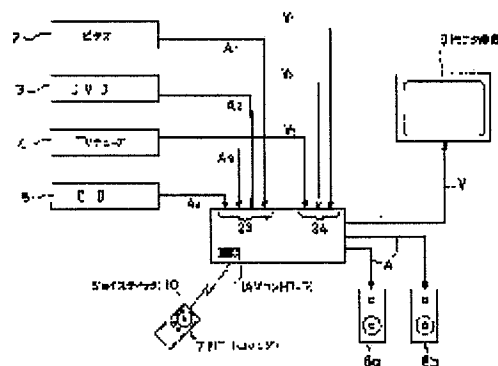
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(54) DISPLAY CONTROL UNIT

(57)Abstract:

PROBLEM TO BE SOLVED: To move a pointer from a currently displayed icon to a specific icon by one action without any feeling of physical disorder by freely setting an array of key display on a screen and using a multidirectional joy stick.

SOLUTION: On a monitor device 9, an image based upon a video signal V selected by an AV controller 1 is projected. Further, a menu screen generated by a video processor in the AV controller 1 is overlaid on the monitor device 9. Over a look at the overlaid screen, various settings are made by using a remote commander 7. The remote commander 7 is provided with a joy stick 10 which is movable in 8 directions and, for example, when upward input operation is done with the joy stick 10, the pointer at a display position moves to the upper icon at the shortest distance. When downward or right or left operation is done, the pointer moves from the display position to the icon at the shortest distance.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the display control which can select said icon with the pointer which displays the menu screen constituted by two or more icons, and is displayed with said icon.

[0002]

[Description of the Prior Art]The present audio-visual (AUDIO VISUAL ... hereafter, initial is taken and it is only called AV) apparatus, Since remote control of the most is enabled by the remote commander, VTR (Video Tape Recorder), a DVD (Digital Versatile Disk) player, If an AV system is built combining a satellite broadcasting tuner, CD (Compact Disk) player, etc., the number of remote commanders will increase and operation will become complicated. For this reason, to enable it to operate two or more AV equipment is desired by one remote commander.

[0003]As a thing which enabled it to operate two or more AV equipment by one remote commander, the remote commander provided with the learning function is known. If a remote commander with a learning function is used, one commander can be made to memorize all of the command signal of two or more AV equipment. However, in order that such a remote commander may make a command signal memorize corresponding to an operation key, in order to make the command signal of two or more audio video apparatus memorize, it needs to arrange many keys dramatically. For this reason, in the conventional MORT commander, one operation key becomes small, and it becomes difficult to carry out operation, and operation key arrangement becomes complicated. There is what forgets which operation key the user made memorize which command well.

[0004]Then, it considers displaying on a monitoring device the menu screen constituted by iconifying the item for performing various kinds of operation/setting out, selecting an icon using a pointing device, and performing various kinds of operation/setting out. Since various kinds of operation/setting out can be performed by selecting and performing with a pointer the icon displayed on the monitoring device by the operation key on a commander not becoming complicated if a pointing device is used, operativity improves.

[0005]As a pointing device, a mouse, a tablet, etc. are used well conventionally. For example, it can be [a mouse's resolution] high and can move a pointer at high speed. However, since an even table is required, in the environment where an AV system is operated, it is hard to use using a mouse.

[0006]Then, the remote commander using a gyro sensor is proposed. The angular velocity sensor is built in the remote commander using a gyro sensor.

If a hand with a remote commander is moved, a motion of this hand will be detected by the angular velocity sensor in a remote commander, and the signal according to a motion of a hand will be transmitted.

Since the pointer displayed on a monitoring device according to a motion of a hand moves if the remote commander using a gyro sensor is used, an even table etc. do not need but it can be operated even from where.

[0007]

[Problem(s) to be Solved by the Invention]However, the remote commander using a gyro sensor

needs a habituation, in order for a user to be able to manipulate a pointer freely on a screen, since a pointer is moved by motion of a delicate hand. In the remote commander using a gyro sensor, the problem of a shaking hand and the problem by a thermal drift arise.

[0008]Then, it is possible as a pointing device to use the 4 direction joy stick. The 4 direction joy stick has the vertical and horizontal input of four directions and determination input, and like the gyroscope described previously, since the problem by the shaking hand or a thermal drift does not arise, it can be inputted anywhere easily.

[0009]However, in such a joy stick, since it is an input of four directions, a pointer cannot be moved freely in addition to the 4 directions. For this reason, when the icon is irregularly located in a line, when moving a pointer between icons, it may move to an unexpected position, and sense of incongruity may be sensed.

[0010]For example, as shown in drawing 13 (a), it is assumed that the two icons 101b and 101c are arranged under the icon 101a. And now, the pointer 102 is on the icon 101a, and presupposes that the down input was performed by the joy stick. In this case, there are the two icons 101b and 101c in the icon 101a bottom. For this reason, as shown in drawing 13 (b), the case where the pointer 102 is moved to the icon 101b, and the case where the pointer 102 is moved to the icon 101c as shown in drawing 13 (c) can be considered.

[0011]all the icons -- four directions -- such a problem will not be produced if it is made to arrange regularly. However, as a result of customizing the size and arrangement of an icon if needed with selection frequency etc., the arrangement becomes irregular in many cases. Then, when the input for vertical and horizontal all directions is performed from a pointy INGU device, the position of the icon which a pointer should move next is beforehand decided for every icon, and it can consider making a memory memorize. If it does in this way, when moving a pointer between icons, it is lost that a pointer flies to an unexpected position.

[0012]However, in order to make it make the position of the icon which a pointer should move next in this way memorize, the memory which makes the data memorize must be prepared. When it was made to make the position of the icon which a pointer should move next memorize, and a user customizes and the arrangement of an icon is changed, it will be necessary to change also about the information set memorized by the memory.

[0013]Therefore, the purpose of this invention can set up the arrangement of a key display freely on a screen, and there is in providing the display control which can move a pointer to a predetermined icon from the icon shown by one action comfortable for a user now using the joy stick of eight directions.

[0014]

[Means for Solving the Problem]A final controlling element which this invention can be provided with an input means which inputs position information on the eight directions of the left, the right and the upper left, the lower left, the upper right, and the lower right in a top and the bottom, and can output command code corresponding to said position information, While forming a menu screen by arranging various operation/setting-out items as an icon, A display control part which can control a display position of a pointer which points out said icon according to an input of said command code, It has an indicator which can display said menu screen and a pointer at least, When position information on the direction of either the left or the right is inputted by said input means in a top and the bottom, Said display control part moves said pointer to said icon currently displayed on the shortest distance in the direction of the inputted position information from a position as which a pointer is displayed now, When one position information of the upper left, the upper right, the lower left, and the lower right is inputted by said input means, Said display control part constitutes a display control so that a pointer may be moved to said icon currently shown by the shortest distance in a field of the direction of the inputted position information from a position as which a pointer is displayed now.

[0015]Since display control which moves to an oblique direction by alter operation of one action can be performed to move [arrangement / of an icon] a pointer to an oblique direction in an irregular menu screen according to this invention, An icon for which it asks simply can be selected now.

[0016]

[Embodiment of the Invention] Hereafter, the embodiment of the display control of this invention is described. Drawing 1 is a figure showing the example of 1 composition of the AV system with which the display control of this invention is applied as this embodiment. VTR2 which this AV system is connected to the AV controller 1 of a control system, and this AV controller 1, and supplies a sound/image as illustrated, DVD player 3, the TV tuner 4, the AV equipment of compact disc player 5 grade, And it is constituted by the loudspeakers 8a and 8b and the monitoring device 9 which are arranged as an output unit.

[0017] Audio signal A_1 supplied to the AV controller 1 as an input stage from VTR2, DVD player 3, the TV tuner 4, and the compact disc player 5, The video input terminal group 24 for inputting video signal V_1 supplied from VTR2, DVD player 3, and the TV tuner 4, V_2 , and V_3 as the audio input terminal group 23 for inputting A_2 , A_3 , and A_4 is formed.

[0018] And after choosing and carrying out power amplification of the signal of desired apparatus out of audio signal A_1 from the AV equipment connected to the audio input terminal group 23, A_2 , A_3 , and A_4 so that it may mention later as processing of a voice system, the loudspeakers 8A and 8B are supplied. As processing of a video system, the video signal of desired apparatus is chosen out of video signal V_1 supplied from the video input terminal group 24, V_2 , and V_3 , and the video signal from selected apparatus is supplied to the monitoring device 9. This selection operation interlocks, and it may be made to change a sound/image, and it may enable it to choose each independently. Although the audio input terminal group 23 shows four sounds and the video input terminal group 24 in this figure as three images for convenience, each input terminal may be provided if needed actually.

[0019] The picture based on video signal V selected by the AV controller 1 projects on the monitoring device 9. In order to control this AV system, the superimposed display of the screens (menu screen etc.) of forming-of video processor in AV controller 1 various kinds is carried out to this monitoring device 9. Various kinds of setting out can be performed using the remote commander 7, looking at this screen by which the superimposed display was carried out.

[0020] The AV controller 1 and each AV equipment are connected by the control bus in the course which is not illustrated. The command transmitted from the remote commander 7 can be supplied to each AV equipment via the AV controller 1 by this, and it is also possible to perform various control of AV equipment from the remote commander 7.

[0021] Next, the appearance composition of the remote commander 7 is explained according to the perspective view of drawing 2. The joy stick 10 with which the remote commander 7 moves in the eight directions is formed. In the remote commander 7, if the upper part 10a of the joy stick 10 is pressed, an above input will be made, and if the lower part 10b is pressed, a down input will be made. If the right part 10c is pressed, the input to the right will be made, and if 10 d of left portions are pressed, the input to the left will be made.

[0022] If the upper left portion 10e of the joy stick 10 is pressed, the input to the direction of the upper left will be made, and if 10 f of upper right portions are pressed, the input to the direction of the upper right will be made. If 10 g of upper left portions are pressed, the input to the direction of the upper left will be made, and when 10 h of direction [lower right] portions are pressed, the input to the direction of the lower right will be made. Therefore, what is necessary is just to press the portion of a request of the joy stick 10 corresponding to the direction, when selecting the icon etc. which have been projected on the monitoring device 9 and moving a pointer in a certain direction. And when movement is completed, the icon selected by pushing the central part 10i of the joy stick 10 is become final and conclusive.

[0023] The electric power switch 11a which supplies a power supply to the AV controller 1, the display key 11b at the time of performing a menu indication, etc. are formed in the remote commander 7. And if alter operation is performed by the joy stick 7, the electric power switch 11a, and the display key 11b (the electric power switch 11a and the display key 11b are hereafter called operation key group 11), It becomes irregular with infrared rays etc. and the command according to the operation is transmitted to the AV controller 1 from the transmission section 12.

[0024] the remote commander 7 is constituted in drawing 3 -- an example of a circuit block is shown

in part. Operation of the joy stick 10 and the operation key group 11 will supply the input signal based on this operation to the control section 15. The control section 15 accesses the memory (ROM...Read Only Memory) 16 various kinds of command codes are remembered to be according to an input signal, for example, reads the command code according to the input direction of the joy stick 10. And in the infrared modulation part 17, this command code is transmitted from the transmission section 12 as an infrared signal, after becoming irregular by a predetermined subcarrier.

[0025]Drawing 4 shows an example of the circuit block which constitutes the AV controller 1. In the audio selector 21, via the terminals 23a, 23b, 23c, and 23d provided in the audio input terminal group 23, Audio signal $A_1 - A_4$ are supplied, these audio signal $A_1 - A_4$ are chosen, and a gap or one line is outputted. Via the terminals 24a, 24b, and 24c provided in the video input terminal group 24, video signal $V_1 - V_3$ are supplied to the video selector 22, and any one line is chosen and outputted to it.

For convenience, the audio input terminal group 23 can provide each input terminal in this figure if needed actually, although four sounds and the video input terminal group 24 are shown as three images. It is also possible to change setting out of the display style of the icon which chooses the AV equipment displayed on the menu screen mentioned later by this.

[0026]Power amplification of the audio signal A selected by the audio selector 21 is supplied and carried out to the amplifier 25. And the output of this amplifier 25 is outputted from the audio output terminals 26a and 26b, and is supplied to the loudspeakers 8a and 8b.

[0027]Video signal V selected by the video selector 22 is supplied to the video processor 32, and it is supplied to the terminal 31b of the switch 31. The video processor 32 is constituted so that it may superimpose or change and the OSD (On Screen Display) display of the menu screen etc. which are explained later, for example may be outputted to video signal V selected if needed by the video selector 22 by control of the control section 34. For example, when outputting video signal V selected by the video selector 22 as it is, the switch 31 connects with the terminal 31b side, and when superimposing or changing and outputting a menu screen etc. by the video processor 32, it connects with the terminal 31a. A user's operation can perform this connection change.

[0028]The control section 34 inputs the command signal supplied from the remote commander 7 via the receiving demodulating part 35, constitutes the AV controller 1, for example, is controlling the various function circuit of the audio selector 21, the video selector 22, the amplifier 25, the switch 31, and video processor 32 grade. For example, if a user operates an input change by remote commander 7 grade, select signal S_1 for switching an input source signal and S_2 will be outputted, and switching control of the audio selector 21 and the video selector 22 will be performed by this select signal. If operation which displays a menu screen similarly is performed, while changing the switch 31 to the terminal 31a side, a menu screen is generated by the video processor 32 and it comes to be outputted from the video output terminal 33.

[0029]The display position of a pointer for an icon to be shown displayed with a menu screen can be controlled now. In this invention, if the command signal according to the input of eight directions is supplied for example, it is based on the joy stick 10, display control will be performed to the video processor 32 so that a pointer can move between icons according to this command signal. The necessary minimum operation key is provided in the final controlling element 36 of AV controller 1 main part, and operation performed by the remote commander 7 and almost same operation can be performed now to it.

[0030]As mentioned above, in the AV system to which this invention was applied, various kinds of setting out can be performed by operating the remote commander 7, being able to display the menu screen for controlling this AV system, etc. on the monitoring device 9, and looking at this menu screen.

[0031]Drawing 5 is a ** type figure showing an example of the menu screen displayed on the monitoring device 9. The selection icons 51a, 51b, 51c, 51d, 51e, and 51f which choose each AV equipment connected to the AV controller 1, for example as the upper row of the menu screen shown in this figure are arranged, and the selection icons 51a-51d support each AV equipment shown in drawing 1. The selection icons 51e and 51f are formed for the AV equipment connected in

addition to this, and when a user sets up after connection, they will have a function for choosing the AV equipment.

[0032]IR set icon 53a for setting an infrared code to the lower berth of a menu screen for every maker, The user IR icon 53b for making an infrared code learn according to a user's inclination, The auto icon 53c for setting up a function when switch one is carried out, The index icon 53f for attaching an index to the macro icon 53e for setting up the setup icon 53d for setting up the color of a screen, a motion of a pointer, etc. and macro operation and a various function is arranged. The EXIT icon 54 is formed in the lower right corner of a menu screen. This EXIT icon 54 is formed in order to terminate this menu screen. what each icon only attaches numerals below and is called an icon -- things are used.

[0033]On a menu screen, the pointer P for pointing out each of these icons with each icon is displayed. According to operation of the RIMOTO commander's 7 joy stick 10, this pointer P is aslant [four-directions] movable, in order to point out each above-mentioned icon (51a-51f and 53a-53g, 54). this time -- the pointer P -- each icon -- it moves, pointing out a center portion mostly.

[0034]Here, the moving operation of the pointer P is explained. Drawing 6 is a figure showing the position of the present pointer, and the position the icon is indicated to be in ** type. Display position IP of the present icon is shown in this figure at the center, above [on a perpendicular direction, i.e., a Y-axis,], for example, icon U_1 and U_2 are located from this display position IP, and, below, for example, icon D_1 and D_2 are located. Icon R_1 and R_2 are located in for example, icon L_1 , L_2 , and right-hand side from display position IP at the method of the left on a horizontal direction, i.e., the X-axis. In the upper left field of display position IP considered as except on the X-axis and a Y-axis, LU_1 of an icon, In the lower left field of LU_2 , LU_3 , LU_4 , and display position IP, icon LD_1 , LD_2 , In LD_3 , LD_4 , and an upper right field, it is assumed that icon RD_1 , RD_2 , RD_3 , and RD_4 are located in icon RU_1 , RU_2 , RU_3 , RU_4 , and a lower right field.

[0035]If above alter operation is performed by the joy stick 10 when the pointer P is located in display position IP, a pointer will move to icon U_1 of the shortest distance above. And when there is an above input again, a pointer moves to icon U_2 further. Similarly, when the alter operation of down, the left, and the right occurs, a pointer will move to the icon located in the shortest distance on a Y-axis and the X-axis. When alter operation of for example, the direction of the upper left is performed by the joy stick 10, it moves to the icon of the shortest distance in the icon which goes from display position IP and is located in an upper left field. That is, in this example, it will move to icon LU_1 . Similarly, when the alter operation of the direction of the lower left, the direction of the upper right, and the direction of the lower right occurs, a pointer will move to the icon located in a lower left field, an upper right field, and a lower right field at the shortest distance.

[0036]When the pointer P has pointed out icon LU_1 , for example, if alter operation of the direction of the upper right is performed, it will move to the position which shows icon U_2 , and if alter operation of the direction of the upper left is performed, it will come to move to the position which shows icon LU_4 . Thus, in this invention, it can choose now by performing alter operation corresponding to the direction for the icon currently displayed on the oblique direction by one action.

[0037]Next, a menu screen is made to correspond and the moving operation of the pointer P explained by drawing 6 according to drawing 7 is explained. For example, when the present pointer P has pointed out the icon 51c as shown in drawing 7 (a), When alter operation of the direction of the lower left is performed by the joy stick 10, the pointer P moves to the position which points out the icon 53 currently displayed on the lower left direction of the icon 51c as shown by the dashed line arrow. That is, an IR SET icon will be selected. icon 51c The pointer P as shown in drawing 7 (b) when having pointed out, When alter operation of the direction of the diagonal below is performed by the joy stick 10, the pointer P moves to the position which points out the icon 53c currently

displayed on the lower right direction of the icon 51c as shown by the dashed dotted line. That is, an auto icon will be selected.

[0038]When the present pointer P has pointed out the icon 53c as shown, for example in drawing 7 (c), When alter operation of the direction of the upper left is performed by the joy stick 10, the pointer P moves to the position which points out the icon 51c currently displayed on the upper left direction of the icon 53c as shown by the dashed line arrow. That is, the image/sound of the TV tuner 4 connected as AV equipment will be chosen. When the pointer P has pointed out the icon 53c as shown in drawing 7 (d), When alter operation of the direction of the diagonal right is performed by the joy stick 10, the pointer P comes to move to the position which points out the icon 51f currently displayed on the method of the diagonal right of the icon 53c as shown by the dashed dotted line.

[0039]When other icons of the icon which the present pointer P has pointed out caudad are not arranged as shown in drawing 7 (a) and (b), When down alter operation is performed by the joy stick 10, it may set up be made not to move the pointer P and move to either the icon 51a or the icon 51c beforehand.

[0040]Drawing 8 is a figure shown with the flow chart which shows the outline in the case of moving an icon according to the alter operation performed with the joy stick 10. If alter operation of the joy stick 10 is performed (S000), it will be detected whether alter operation of which direction was performed among eight directions (S001). When this detection result is a direction corresponding to the direction of either of vertical and horizontal, i.e., the X-axis shown in drawing 6, and a Y-axis, it progresses to Step S002. And when it distinguishes whether the icon is arranged in the direction (a top, the bottom, left, or right) to which alter operation was carried out and the icon is arranged, In the direction, a pointer is moved to the icon currently displayed on the shortest distance from the position as which the present pointer is displayed (S003).

[0041]At Step S001, the direction of alter operation progresses to Step S004, when the upper left, the lower left, the upper right, and the lower right are the directions corresponding to upper left fields other than the X-axis and a Y-axis, the lower left field, upper right field, and lower right field which were shown in the direction, i.e., drawing 6, either. And when it distinguishes whether it is the no by which the icon is arranged to the field corresponding to the direction (the upper left, the lower left, upper right, lower right) to which alter operation was carried out and the icon is arranged, A pointer is moved to the icon currently displayed on the shortest distance from the position as which the present pointer is displayed in the field (S005).

[0042]When the icon was not arranged to the direction concerned and the field concerned by Step S002 and S004 and it is distinguished, it also moves a pointer and makes, and it is good or may be made to make it move to the set icon of a direction which was set up beforehand, as stated previously.

[0043]Thus, the oblique direction according to the arrangement of the icon displayed in a menu screen can be easily inputted by using the remote commander 7 which has the joy stick 10 in which the alter operation of eight directions is possible. This can perform [the user] moving operation of a pointer now comfortable.

[0044]By the way, when moving the pointer P by the alter operation of the joy stick 10, a user's impressions over alter operation differ by whether the pointer P is moved to the icon for which it asks how. If the pointer P flies suddenly to the next display position, when the position of the icon which should move to the next is separated, the pointer P may be missed temporarily. For this reason, the locus of pointer movement is wanted to be displayed. It is uncomfortable, when displaying the locus of the pointer P and distance with the next movement destination is close, distance with a movement destination is separated and the pointer P is always moved similarly. Then, it is possible to display the locus, moving the pointer P with constant speed between each icon.

[0045]Drawing 9 is the example to which a uniform model expresses the locus of the pointer P, and the pointer P was moved with constant speed.

[0046]In drawing 9, it is judged whether it is the no which the movement destination of the pointer P determined with the above-mentioned algorithm (S201). If the movement destination of the pointer

P is decided, it will be judged whether the movement destination is the up-and-down perpendicular direction (S202). Here, the coordinates which move the coordinates of the present pointer to (x_0, y_0) , and the next are made into (x_1, y_1) .

[0047]If a movement destination is the up-and-down perpendicular direction, it is judged whether only fixed time Δt passed (S203) and only fixed time Δt passes, the coordinates of the horizontal pointer P will be made into $(x=x_0)$, and, perpendicularly, the pointer P will move only Δy ($y=y+\Delta y$) (S204). Thus, the pointer P is displayed on the advanced coordinates (x, y) (S205).

[0048]The no or ($y>y_1$) which had reached coordinates y_1 which the vertical coordinates y make the purpose is judged (S206). If coordinates y_1 of the pointer which the vertical coordinates y make the purpose is not reached, it Δy only (S207) and the vertical coordinates y return to Step S203.

[0049]By such control, a pointer moves perpendicularly gradually at uniform velocity, and approaches target coordinates (x_1, y_1) . If coordinates y_1 of the pointer which the vertical coordinates y make the purpose is reached at Step S206, target coordinates (x_1, y_1) will be reached.

[0050]If the movement destination is judged not to be the up-and-down perpendicular direction at Step S202, the inclination m to the coordinates of the pointer moved to the next of the present pointer (x_1, y_1) from coordinates (x_0, y_0) will be called for (S208).

[0051]If it is judged whether only fixed time Δt passed when the inclination m was called for (S209) and only fixed time Δt passes, coordinates will be advanced only Δx ($x=x_0+\Delta x$) horizontally and a pointer will be carried forward perpendicularly only $m\Delta y$ ($y=y_0+m\Delta y$) (S210). Thus, the pointer of the advanced coordinates (x, y) is displayed (S211).

[0052]***** [having reached coordinates x_1 of the pointer which the horizontal coordinates x make the purpose] ($x>x_1$ is judged (S212).) If coordinates x_1 of the pointer which the horizontal coordinates x make the purpose is not reached, it Δx only (S213) and the horizontal coordinates x return to Step S209.

[0053]By such control, the pointer P moves gradually at uniform velocity, and approaches target coordinates (x_1, y_1) . If coordinates x_1 of the pointer which the horizontal coordinates y make the purpose at Step S212 is reached, target coordinates (x_1, y_1) will be reached. Thus, if a uniform model expresses movement of the pointer P, the pointer P will move at uniform velocity to the next movement destination, and the locus of the pointer P can display comfortable.

[0054]furthermore -- if human being actually analyzes key operation -- (a) -- if a finger is first lifted from the key operated slowly now, power is put in to some extent, a hand is quickly moved toward the key of the (b) purpose and the key of the (c) purpose is approached, speed will be loosened so that a key may be reached certainly. It is made like.

[0055]Such operation is close to the model of simple harmonic motion. From this, it is possible to move a pointer according to a simple-harmonic-motion model. Such a simple-harmonic-motion model can be expressed as shown in drawing 10 and drawing 11. In the model shown in drawing 10 and drawing 11, the object 101 is attached to one end of the spring 103, and the other end of the spring 103 is fixed to the fixed point 102. And the object 101 vibrates with amplitude as shown with the amplitude aluminum and A2. An operation [in / using such a model / Step S204], [Equation 1]

$$x = \frac{x_1 + x_0}{2} + \left| \frac{x_1 - x_0}{2} \right| \cos \left(-\frac{\pi}{2} + \theta \right)$$

An operation [in / it carries out and / Step S210],[Equation 2]

$$x = \frac{x_1 + x_0}{2} + \left| \frac{x_1 - x_0}{2} \right| \cos \left(-\frac{\pi}{2} + d\theta \right)$$

$$y = \frac{y_1 + y_0}{2} + \left| \frac{y_1 - y_0}{2} \right| \cos \left(-\frac{\pi}{2} + d\theta \right)$$

Then, the pointer P moves at the speed according to a simple-harmonic-motion model.

[0056] It is possible to move this motion according to a model in case a magnet and iron pay well, as shown in drawing 12. In drawing 12, when there are the magnet 106 and the iron piece 105, the magnet 106 and the iron piece 105 are pulled by magnetism, and suit. The model at this time,

[Equation 3]

$$x = at^2 + x_0$$

It is alike, and it is expressed so that it may be shown. If the pointer P is moved according to such a model, the pointer P can be moved as iron is pulled to a magnet.

[0057] A uniform-acceleration model expresses a motion of the pointer P, and it may be made to move it.

[0058]

[Effect of the Invention] As mentioned above, as explained, in a top and the bottom, the display control of this invention can move a pointer by the control code corresponding to eight directions by the joy stick which can perform alter operation of the left, the right and the upper left, the lower left, the upper right, and the lower right, i.e., eight directions. Even if it is movement of an oblique direction, etc. when two or more operation/setting-out items, such as an icon, are not arranged regularly in all directions by this or, it can carry out that there are not ease and sense of incongruity for a user. Therefore, the user can perform smooth selection operation now according to the locating position of the icon displayed on a menu screen etc. It is lost by displaying the locus at the time of moving a pointer that a user misses during movement of a pointer. Thereby, since the user can always grasp the display position of a pointer, he can improve operativity.

[Translation done.]

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CLAIMS

[Claim(s)]

[Claim 1]A final controlling element which can be provided with an input means which inputs position information on the eight directions of the left, the right and the upper left, the lower left, the upper right, and the lower right in a top and the bottom, and can output command code corresponding to said position information, While forming a menu screen by arranging various operation/setting-out items as an icon, A display control part which can control a display position of a pointer which points out said icon according to an input of said command code, It has an indicator which can display said menu screen and a pointer at least, When position information on the direction of either the left or the right is inputted by said input means in a top and the bottom, Said display control part moves said pointer to said icon currently displayed on the shortest distance in the direction of the inputted position information from a position as which a pointer is displayed now, When one position information of the upper left, the upper right, the lower left, and the lower right is inputted by said input means, A display control characterized by making it said display control part move a pointer to said icon currently shown by the shortest distance in a field of the direction of the inputted position information from a position as which a pointer is displayed now.

[Claim 2]The display control according to claim 1 displaying a locus which said pointer moves when moving said pointer to operation/setting-out item newly chosen from operation/setting-out item chosen now.

[Claim 3]The display control according to claim 2, wherein the above-mentioned locus is moved according to a uniform model.

[Claim 4]The display control according to claim 2, wherein the above-mentioned locus is moved according to an accelerator model.

[Claim 5]The display control according to claim 2, wherein the above-mentioned locus is moved according to a simple-harmonic-motion attenuation model.

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

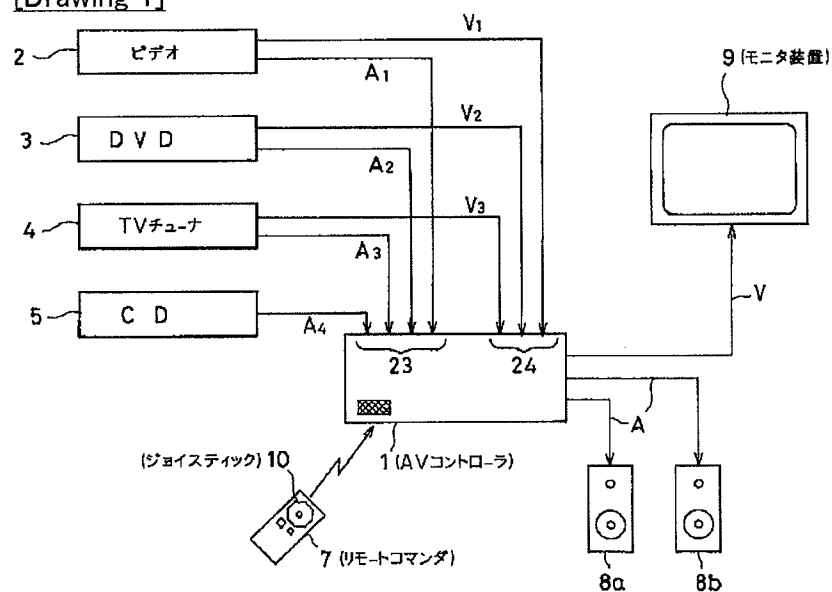
1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.*** shows the word which can not be translated.

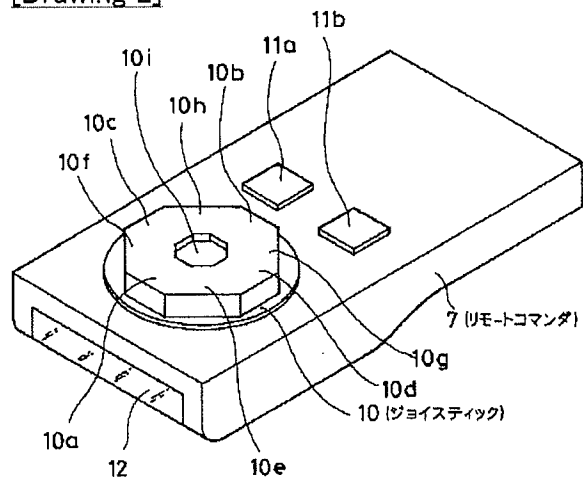
3.In the drawings, any words are not translated.

DRAWINGS

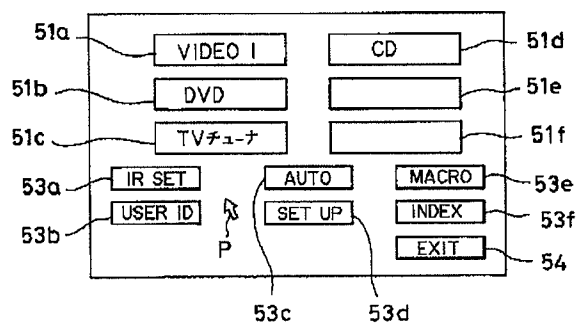
[Drawing 1]



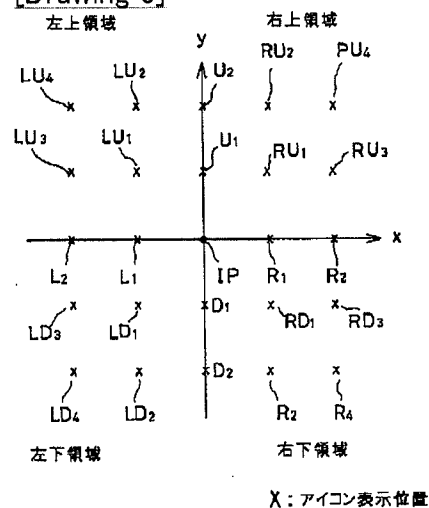
[Drawing 2]



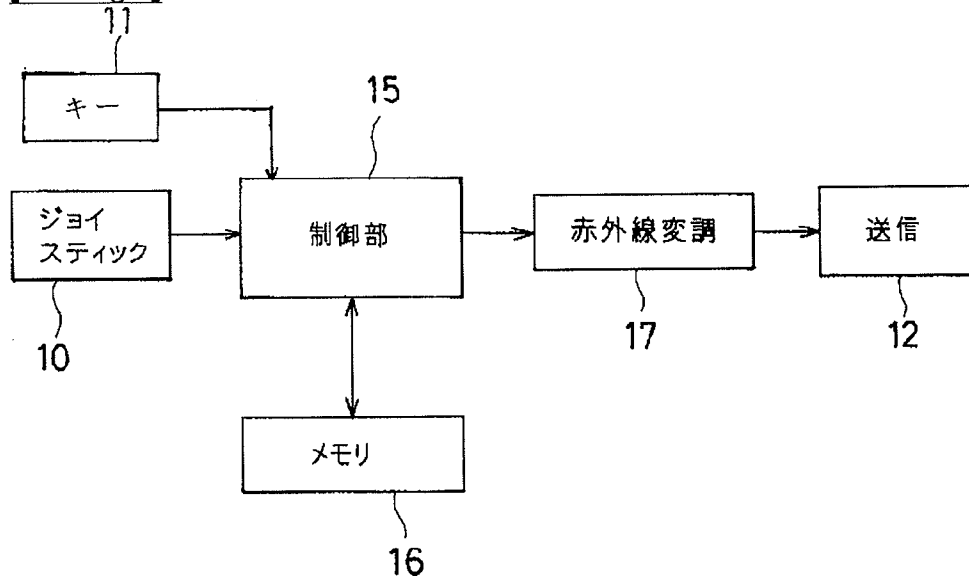
[Drawing 5]



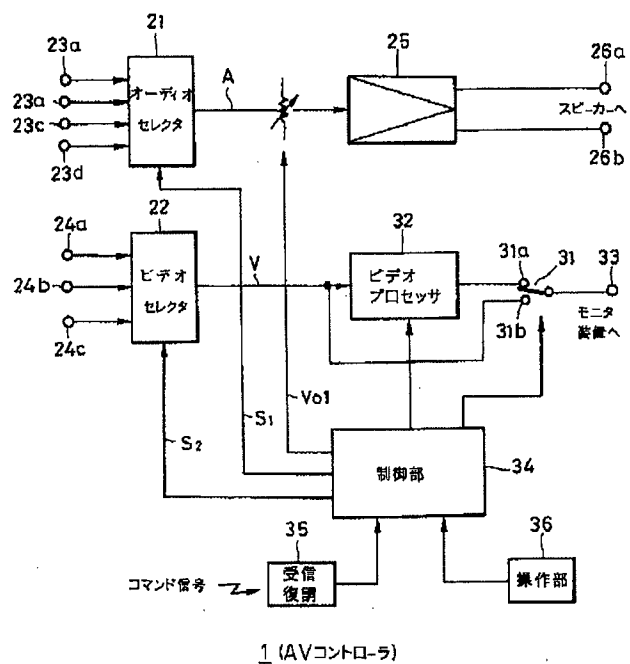
[Drawing 6]



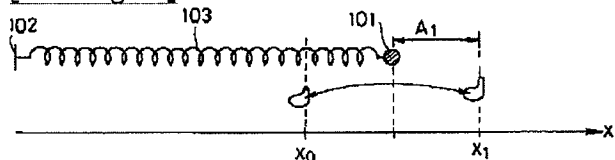
[Drawing 3]



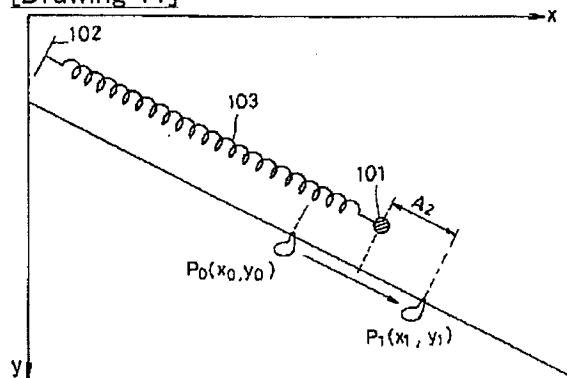
[Drawing 4]



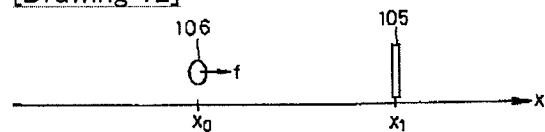
[Drawing 10]



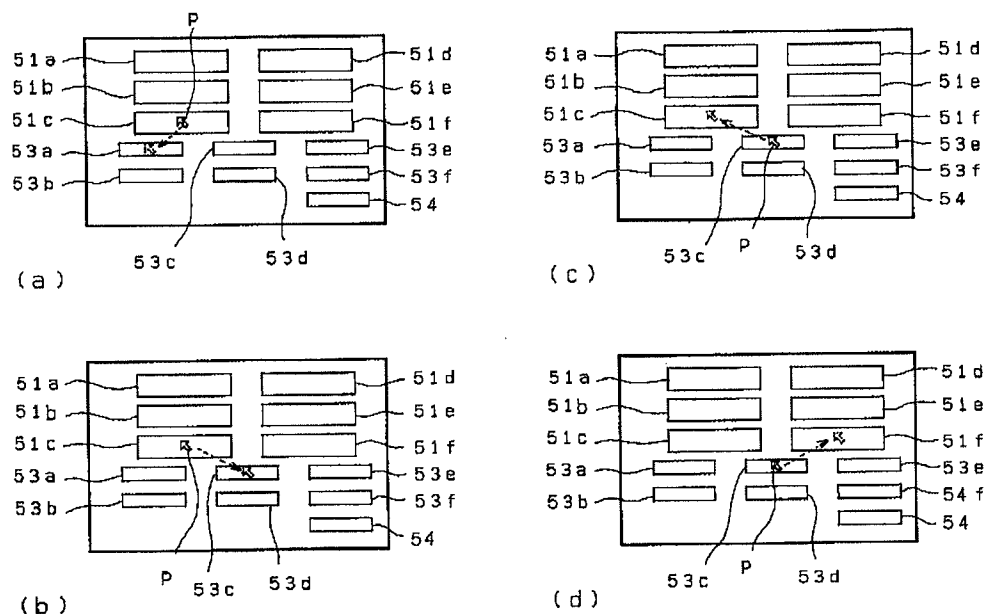
[Drawing 11]



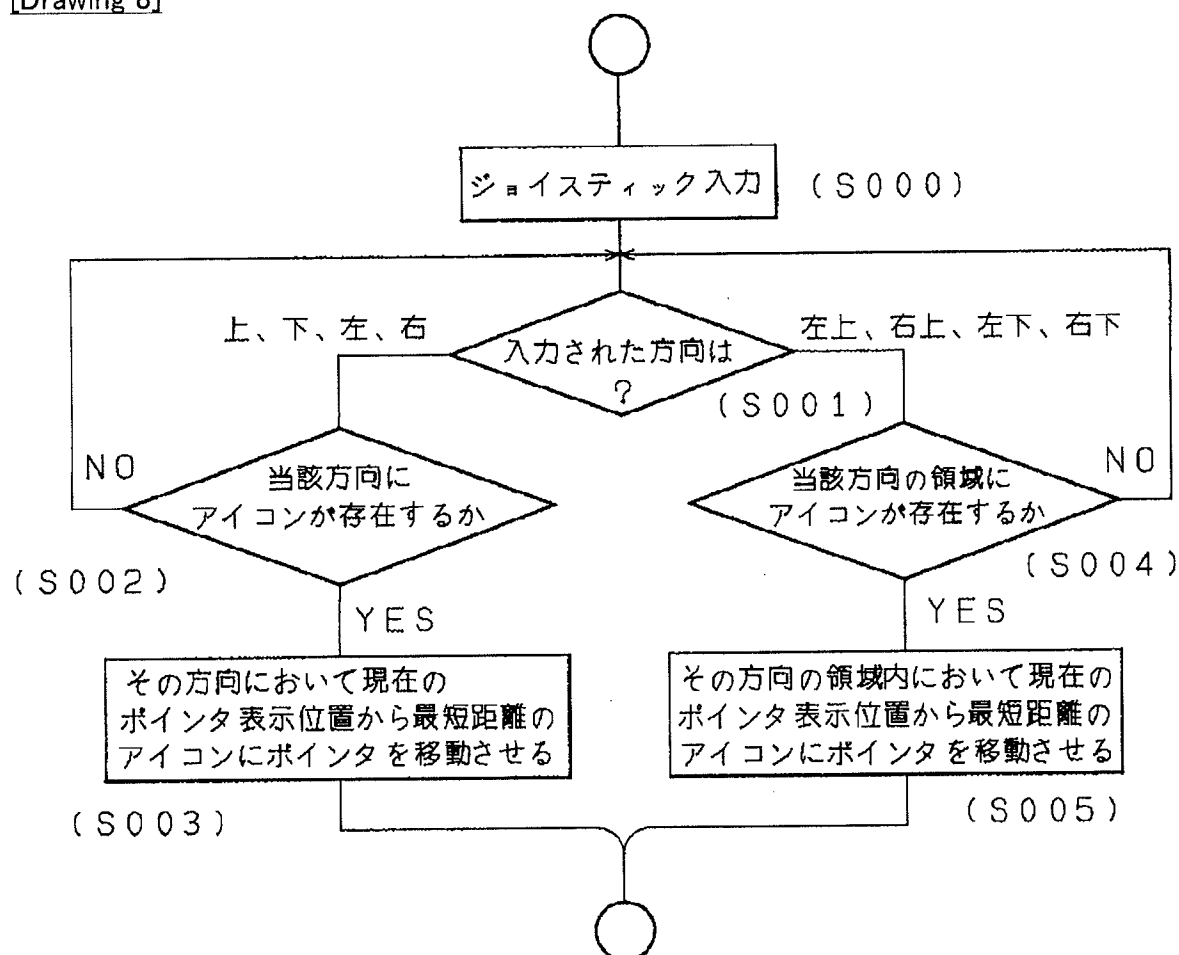
[Drawing 12]



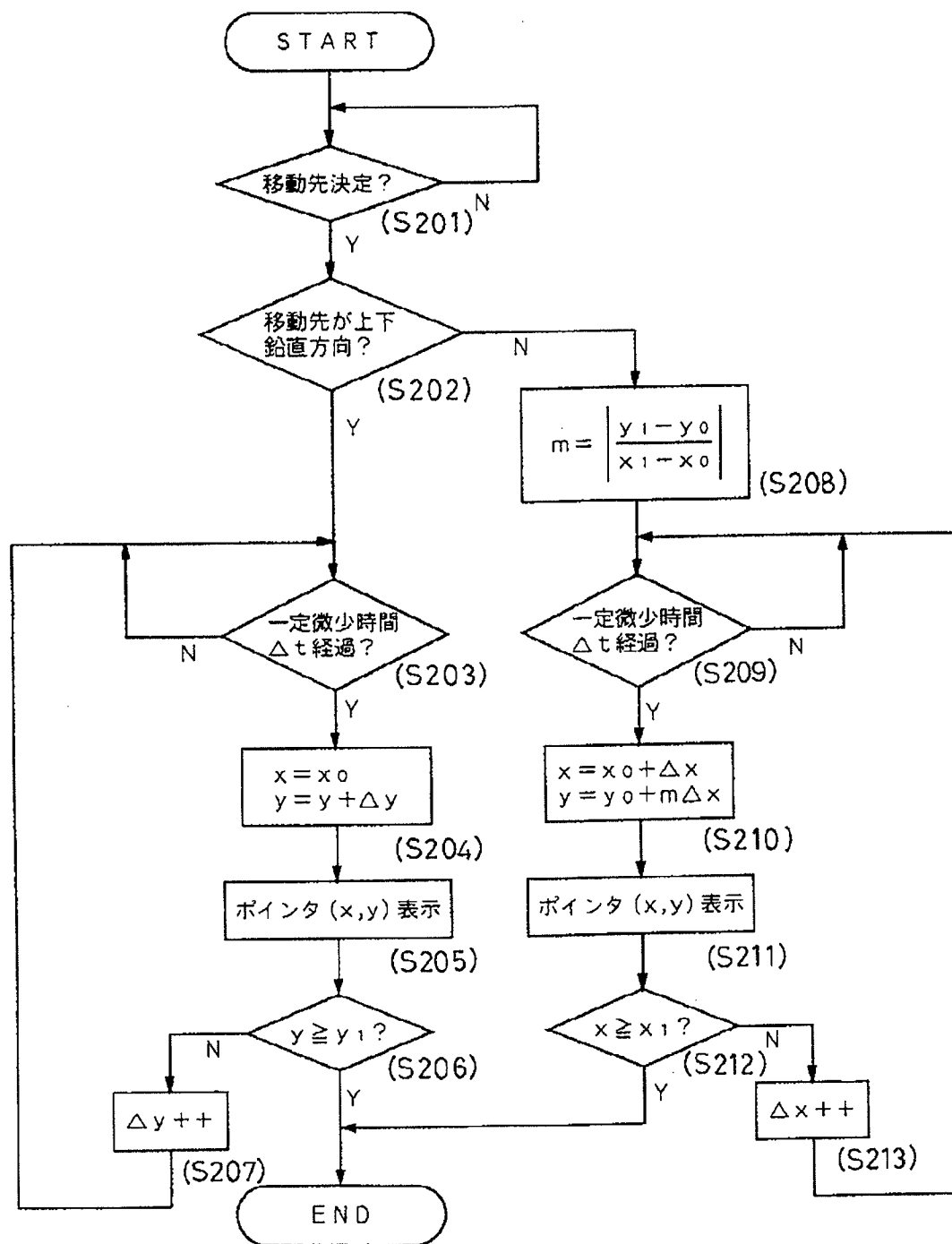
[Drawing 7]



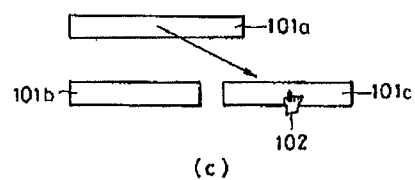
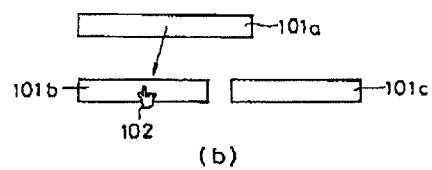
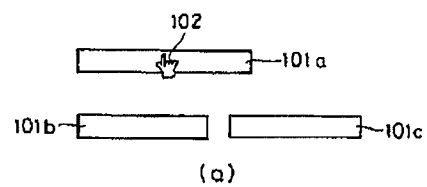
[Drawing 8]



[Drawing 9]



[Drawing 13]



[Translation done.]